REMARKS/ARGUMENTS

In the Office Action mailed December 6, 2006, claims 1-22 were rejected. Applicants have thoroughly reviewed the outstanding Office Action including the Examiner's remarks and the references cited therein. The following remarks are believed to be fully responsive to the Office Action. All the pending claims at issue are believed to be patentable over the cited references.

CLAIM REJECTIONS – 35 U.S.C. § 102

Claims 19-22 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Rittman. Applicants respectfully traverse.

Initially, Applicants note that it is axiomatic that to qualify as an anticipation under Section 102, the cited reference must "bear within its four corners adequate directions for the practice of the patent invalidated." (See, for example, Dewey & Almay Chemical Co. v. Mimex Co., Inc., 52 U.S.P.Q. 138 (2nd Cir. 1942)).

The reference does not teach or suggest the combination recited by claim 19. For example, Applicants' independent claim 19 recites, in relevant part: (a) "transmitting an RF signal that includes an *integral RF test signal* into an RF transmission system..." (b) "receiving reflections, if present, of the RF test signal from the RF transmission system with a *combining system* located proximate to the end of the transmission system at which the transmitter is located..." (c) "processing the received reflections to establish a first pattern of time intervals from the original RF test signal to each reflection, and *comparing the first pattern* of time intervals of received reflections *to a second, predetermined pattern thereof*..." (emphasis added). The Office Action asserts that Rittman discloses this apparatus. Applicant respectfully traverses.

The Office Action states, "Rittman discloses a system which tests the CATV systems transmission by generating/transmitting quasi-random data along transmission path (22) which is recovered and analyzed for ghosts/reflections using oscilloscope 24 and PC using MATLAB 40 (Fig 5). As shown in the figure the system passes RF signals with the generated random data where the signals are analyzed at a location near the transmitted end in order to eliminate any undesirable equalization by the receiver/set-top box. Regarding the time intervals, Rittman discloses the autocorrelation of the transmitted signal with the reflected signal (col 5. line 5-15). Rittman discloses that the data corresponding to the reflections/ghosts of the transmitted data is recovered on digital oscilloscope 24 and then transferred to a MatLab program running on a PC 40 for analysis."

Rittman describes using a pseudorandom (repeating) pattern generator to generate simulated quadrature amplitude modulation (QAM) symbols at a rate approximating the pixel rate in one of the lesser digital television (DTV) modulation schemes—roughly 30 Msps of 64QAM (8 bit) symbols if the language of the patent is roughly correct (col. 6, ll. 34-40)—with some 16,000 randomly-sequenced symbols in the pattern so generated. Rittman further modulates this QAM data stream at 4 MHz, where by contrast a CATV system modulates each such stream at 58 MHz or greater. This signal is thus not similar to the signal present within a CATV system, which generally include a hundred or more channels, wherein each channel has a 6 MHz bandwidth, so that a typical CATV coaxial line is required to support a band that ranges from 54 MHz to at least 650 MHz.

As disclosed by Rittman, The test setup of FIG. 5 is programmed to use autocorrelation rather than another detection methodology, such as time domain reflectometry (TDR) or frequency sweep (col. 3, l. 65-col. 4, l. 7). Rittman asserts that a drawback to TDR and frequency sweep is the need to take a CATV system offline or inject a test signal into a cable, using unoccupied bandwidth, in order to transmit and receive the test signal (col. 4, ll. 3-7), and to at worst converge an adaptive equalizer or demodulate data in order to identify cable faults

(col. 4, ll. 8-9). Rittman uses the pseudorandom component of 64QAM data in DTV signals as the basis for autocorrelation in full-scale CATV systems using non-invasive testing (col. 6, ll. 25-31).

The configuration of FIG. 5 of Rittman does not recommend itself for normal operation. Merely replacing the test signal generator 20 of FIG. 5 with a source of a working (i.e., CATV-level broadband distribution) signal directs such a working signal into the test configuration of FIG. 5. This causes the working signal to enter the first splitter 30, thereby redirecting substantially half or more of the working signal that would otherwise feed into the coaxial line 36. Rittman implies (col. 6, ll. 44-46) that the second and third splitters 32 and 34, respectively, are not distinguishable from the first splitter 30, so that the configuration of FIG. 5 recombines the split portions of the working signal with unspecified delays, and does not direct a transmission signal to the coaxial line under test 36 in a controlled environment. The second splitter 32 of Rittman connects the recombined direct and reflected signals into a single input of an oscilloscope 24 with an unreferenced 50 ohm termination resistor, with the autocorrelation algorithm applied to the signal developed across the unreferenced resistor (col. 6, ll. 41-44). Applicants' claim 1, by contrast, claims inserting forward and reverse directional couplers into a transmission line, wherein the forward coupler is configured to tap forward-directed energy from a transmission system onto a first output line, and the reverse coupler is configured to tap reflected energy (para. [0022]) onto a second output line.

The signal applied to the autocorrelation-based detector of Rittman is a pseudorandom signal akin to the randomized component of 64QAM, combined with delayed and reduced copies of the same signal, added repeatedly with varying delay. The combined signal will have near-perfect autocorrelation at zero delay, diminished by any reflections, and will have nearly zero autocorrelation at any other delay value, excepts as a reflection superimposes a faint copy of the original signal onto the combined signal. At each such reflection, as shown in FIG. 9, for

example, the autocorrelation will exhibit a deviation, up to a small fraction of the zero-delay autocorrelation, with the magnitude of the deviation proportional to the strength of the reflection.

A system wholly as described by Rittman does not anticipate Applicants' invention for a transmission facility, at least because Rittman does not describe a realization using a test signal within a transmission signal, and because the configuration disclosed in Rittman does not include extraction of separate forward and reflected signals using directional couplers. Thus, Rittman does not teach or suggest the combination recited by claim 19, and a § 102 rejection is not proper.

Claims 20-22 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Rittman. Each of these claims depends from claim 19. Therefore, for at least the reasons above, claims 20-22 are allowable.

In light of the foregoing arguments, withdrawal of the rejection of claims 19-22 under 35 U.S.C. § 102(b) is respectfully requested.

CLAIM REJECTIONS – 35 U.S.C. § 103

Claims 1-9 and 13-16 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Rittman in view of Applicant's Admitted Prior Art (AAPA). Applicants respectfully traverse.

The Examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. *MPEP §2142.* To establish a prima facie case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, to modify the references or to combine reference teachings. Second, there must be reasonable expectation of success. Finally, the prior art must teach all the claim limitations. *MPEP §2142*

Rittman does not teach or suggest the combination recited by independent claims 1 and 13. For example, Applicants' independent claim 1 recites, in relevant part: "a transmission system configured to carry RF signals from a source site to a destination site, a termination RF

load, located at said destination site, a combining system electrically connected within said transmission system and configured to pass RF signals from said source site ... wherein said combining system further comprises a forward directional coupler configured to tap RF signals progressing from said source site, and a reverse directional coupler configured to tap reflected RF signals, and wherein said combining system provides as separate electrical outputs RF signals from said source site and RF signals that have been reflected from loci within said transmission system, and a test signal source, wherein a test signal from said test signal source is embedded within an RF signal stream fed into said transmission system from said source site." Claim 13 recites, in relevant part: "means for directing an RF signal from an RF signal source to an RF load, means for producing a test signal embedded within the stream of an RF signal, means for coupling a forward-directed portion of the RF signal directed from the RF source to the RF load into a means for detecting the test signal, means for coupling a reflected portion of the RF signal, directed back from a source of reflection within the means for directing, toward the RF source, into the means for detecting the test signal, and means for comparing times of arrival of the forward-directed and reflected portions of the test signal coupled from the means for directing, within the means for detecting the test signal."

The Office Action states that the IEEE STD 100-1996, 6th edition (a dictionary) describes directional couplers ("Directional Coupler. A transmission coupling device for separately (ideally) sampling (through a known coupling loss for measuring purposes) either the forward (incident) or the backward (reflected) wave in a transmission line."). This reference fails to teach or suggest replacing splitters with directional couplers.

Rittman does not disclose extraction of separate forward and reverse output signals from a transmission system. Further, Rittman does not disclose directional couplers, at least because the autocorrelation algorithm described in Rittman requires combined forward and reverse signal samples. Indeed, were the splitters of Rittman to be replaced with directional couplers, no specific result could be anticipated, as the configuration of FIG. 5 of Rittman does not

accommodate directional couplers without alteration. Thus, combining directional couplers with the autocorrelation algorithm of Rittman is not obvious.

Although the alleged AAPA cited in the Office Action is usable for the Applicants' purpose, use of the alleged AAPA for the purpose claimed by Applicants was not intended or conceived when the embedded Ghost Cancellation Reference (GCR) signal was developed. Indeed, the GCR signal, use of which for transmission line testing is claimed in dependent claim 2, was developed to be used by receivers for dynamic multipath correction, as disclosed at length in the Application at least in paragraphs [0007] and [0026]. The use of the GCR signal for testing broadcast transmission line integrity and for tracking transmission line degradation over time was not contemplated in the development of the GCR signal (see attached Reference Appendix). Thus, the use of this receiver test signal for transmitter analysis is outside the expected range of innovation for a practitioner of the art at the time the invention was conceived. Thus, Rittman in view of Applicants' alleged AAPA does not teach or suggest Applicant's invention as recited in claims 1 and 13, and a *prima facie* case for obviousness has not been established.

The Office Action states that, "[a]lthough, it is known as stated by Rittman to inject a test signal or not, the process/application of doing either scheme provides no unexpected results, since less information will occupy less bandwidth, and including two signal streams together increases the possibility for interference. It is also known that depending upon the application, it would be desirable to include such test signal with a normal broadcast signal which would provide an uninterrupted display/channel for the viewer."

Applicant is unclear regarding the intent of this statement. The possibility of interference due to application of multiple signals has no bearing on Applicants' invention. Rittman does not disclose a test signal included with a normal broadcast signal, but rather the intrinsic random component of 64QAM.

Claims 2-9 and 14-16 depend from at least one of independent claims 1 and 13. Therefore, these claims are allowable for at least the foregoing reasons.

Claims 10-12 and 17-18 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Rittman in view of Examiner's Official Notice (EON) regarding need for record keeping and alarm generation. Applicants respectfully traverse. Each of claims 10-12 and 17-18 depends from at least one of independent claims 1 and 13. Therefore, these claims are allowable for at least the foregoing reasons.

CONCLUSION

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. If it is believed that the application is not in condition for allowance, the Examiner is requested to contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application.

In the event this paper is not timely filed, Applicant petitions for an appropriate extension of time. Please charge any fee deficiencies or credit any overpayments to Deposit Account No. 50-2036 with reference to Attorney Docket No. 87321.1800.

Respectfully submitted,

BAKER & HOSTETLER LLP

Raphael A. Valencia
Reg. No. 43,216

Date: 6/19/07

Washington Square, Suite 1100
1050 Connecticut Avenue, N.W.
Washington, D.C. 20036-5304
Telephone: 202-861-1500
Facsimile: 202-861-1783